

EDITORIAL ARTICLES.

ON TUMORS OF THE URINARY BLADDER AND THEIR TREATMENT.

In one of the recent numbers of Volkmann's Collection of Clinical Lectures,¹ this subject is treated at length by Prof. Ernst Küster, of Berlin. Until comparatively recently little has been known of the pathology and therapy of tumors of the urinary bladder, although many writers, some as early as the seventeenth century, have recorded their observations on this malady. At the beginning of the present century, A. G. Richter (1802) and Sömmering (1809) published treatises on the malignant diseases of the bladder. Lateral lithotomy was known to them, and although seldom recommended, was conceded to afford the only reasonably sure means for diagnostic and therapeutic purposes. A considerable advance was made by Civiale, in 1842, who distinguished two forms of tumors of the bladder, namely the fungous and the carcinoma, the latter of which he considered very rare. Podrazki (1865), on the contrary, regards the carcinoma as the most frequent of all tumors of this organ. Civiale was opposed to both suprapubic and lateral cystotomy and Podrazki did not recommend them either.

The uncertainty of the diagnosis made all methods of operating appear extremely dangerous. Progress in the right direction could only be made by an increase of our diagnostic resources, and the merit of having to a very large extent aided in this advance, belongs unquestionably to G. Simon, who, in 1875, first demonstrated that the female urethra is capable of very great dilatation by mechanical means, thus rendering the whole interior of the bladder more or less accessible to both diagnostic and therapeutic measures. The method was after-

¹ No. 269-268. (*Chirurgie N. 84.*)

wards adopted for operations in the male urethra and bladder by R. Volkmann, at first in cases of vesical calculi, a year later for the diagnosis of a large myoma of the bladder. Simon's method, however, came into general use only after it had been perfected by Sir Henry Thompson in 1880-1882.

Unfortunately the development of the pathological anatomy of these parts has not kept equal pace with that of our therapeutic means, and we are still far from possessing adequate knowledge of the pathology of these tumors.

Neoplasms of the bladder develop as primary growths, they extend to it from other neighboring organs, or appear there through metastasis from neoplasms in remotely situated organs. The two latter forms of development belong exclusively to malignant growths, and have, consequently, but a limited interest for the surgeon. The primary tumors are found in the female only in the wall of the bladder, but in the male subject also in the prostate gland. These latter are clinically seldom distinguishable from the former, both producing about the same symptoms, etc., and must be considered here as belonging to the subject before us.

The author gives us the following classification of tumors of the urinary bladder:

A. NEOPLASMS OF THE PROSTATE.—1. *Fibro-adenoma* (Klebs); 2, *Myoma*; 3, *Carcinoma*.

B. NEOPLASMS OF THE BLADDER-WALL.—I. Neoplasms arising from the mucous or submucous connective tissue.

1. *Papilloma* (Krämer), *Fibroma papillare* (Virchow). This is by far the most frequent of all tumor-forms of the bladder, and appears singly or in groups. As single growths they are more often met with in the fundus, then in the trigonum and lastly in the lateral walls of the bladder near the orifices of the ureters. Only very rarely have they been found in other parts of the bladder, and then mostly in groups, several small ones clustering around one large polyp. Küster gives us an elaborate description of these papilloma groups, their microscopical appearance, etc. Thompson has described a transition form of papilloma, i. e. to a malignant growth, and which, he says, is characterized by its rich vascularity and cell-infiltration in the tissues

about its base. This latter is without doubt owing to inflammatory irritation, however. The villi are very delicately constructed, the current of the urine during micturition being of sufficient strength to tear them off and causing, consequently, frequent haemorrhages. The delicate construction of the inadequately supported walls of the blood-vessels in these villi are often also the cause of haemorrhages. Every contraction of the bladder-muscles must compress the blood vessels at the base of the villi, producing, consequently, hyperæmia of these, and leading easily to the rupture of blood-vessels. These formations, by becoming incrusted with the urinal salts, may deceive one as to their real nature, as they are often taken for vesical calculi. Papilloma are more frequently met with in males than in females. Among 15 cases reported by Thompson, there were but two women, and in Sperling's 42 cases 29 were males. This great difference is no doubt owing to the frequent irritation to which the mucous membrane of the bladder is exposed in males, by the extension of inflammatory processes from the urethra, etc., also to the greater difficulty in urinating in men of middle age. Supporting this latter theory we find that most cases are between the ages of 30 and 60 years, seldom earlier.

2. *Fibrous Polypi and Myxoma*.—These are tongue-like or bulb-shaped formations and are found in the region of the neck of the bladder and its base, not in groups as the papilloma, but spread out, as it were, over an extent of the mucous surface. These growths seldom cause haemorrhages, on account of their rather tough structure, and are found mostly in children.

3. *Sarcoma*.—Very rarely seen, but five cases having been thoroughly described and recorded, namely by Senftleben, Marchand, Siewert, Heim-Vöglin, and Schlegendal. Other less careful observations have been made by Head, Hue, Thornton and Sokolow. The greater number are found in female subjects, also all of the first mentioned five cases.

II. Neoplasms arising from the muscular layer of the bladder.

4. *Myoma*.—The first case recorded is one of Rob. Knox in 1862. Others, as A. R. Jackson, Gersuny, and Gussenbauer have observed this form of neoplasm, but Volkmann, in 1876, was the first who thoroughly described a case of undoubted myoma of the bladder. The

tumor was situated at a considerable space away from the prostate, which excludes the possibility of its having been in any way connected with the latter, a doubt evidently existing in all cases published prior to this. Since then a few new cases have been recorded. Belfield (1881) found a myoma of the bladder in two dead subjects, by accident. The structure of these tumors resembles in most points very closely that of uterine myoma.

III. Neoplasms of the epithelium and glandular structures of the bladder.

5. *Adenoma.*

6. *Carcinoma.*—Clinically carcinomata of the bladder are not distinguishable from those of the prostate, so that the latter will have to be considered in this group. Careful study only of the microscopical structure will reveal the real starting-point of the tumor. This latter is of importance not only from a pathological-anatomical standpoint, but also as regards the diagnosis and the therapeutic measures to be undertaken. As the author justly remarks, it would be of vast importance if Klebs' assertion proved true, according to which, namely, all carcinomata of the bladder originate in the prostate gland, consequently a primary tumor found in the fundus of the bladder in a female subject, could not possibly be a carcinoma. When these neoplasms appear in the region of the neck of the bladder in male subjects, suspicion as to their origin would be excited. Although, doubtless, many of those cases described as carcinoma of the bladder, have really originated in the prostate, it cannot be denied, on the other hand, that carcinoma of the bladder itself does occur, developing in the epithelium of that organ. It would be, says Kuster, very remarkable if the epithelium on a mucous surface so frequently exposed to irritations, etc., should differ so entirely in that respect from other mucous membranes of the body. Bode's treatise on the subject (1884) shows that primary carcinomata of the bladder in women are not so very rare, as we find among the 30 cases collected in his report, 14 females. The form of carcinoma most frequently met with here is the papillary, although the medullary form is not seldom seen, cases of the latter having been recorded by Marchand and others. The cancroid-form has been often observed by Thiersch, Paget, Winckel, and Thompson, and the alveo-

lar carcinoma, with its singular tendency to colloid degeneration is also occasionally found. All these forms of carcinoma, including also the glandular form occurring in the prostate, develop first as flat circular protuberances on the mucous surface or as more deeply lying lumps with a smooth surface, immovable over the tumor. Various changes in their appearance soon occur, in consequence of the irritation to which they are more or less exposed. Haemorrhages soon follow, but in many cases precede the development of a cancer. The surface epithelium becomes necrotic and falls off, allowing the urine to come directly into contact with the badly nourished cancer-body which is prone to regressive metamorphosis. Putrid decomposition of the urine follows, producing rapid necrosis of larger or smaller portions of the tumor, keeping the former, in spite of frequent micturition, in a decomposed state. Catarrh of the bladder is the result and the hyperæmic mucous membrane is consequently prone to haemorrhages. The muscular layer of the bladder is soon attacked, its hypertrophied condition, however, generally preventing rapid perforation. Through extension of the purulent inflammation upwards the kidneys become involved, and death soon intervenes, ending the sufferings of the patient.

7. *Dermoid Cysts*.—They are found both as open and closed sacs. Martini, in 1874, published his observations on one of the latter, found in a newly-born male child. The bladder was closed near the urethra, the urine having been passed through the umbilicus. No anus existed, a communication with the intestine, however, being found. The posterior half of the bladder consisted of a portion of cutis covered with hairs. Thompson records a case of open dermoid cyst in a woman 30 years of age.

Regarding the aetiology of tumors of the urinary bladder, Kuster states nothing of much importance, beyond what is generally known. Foetal predisposition here as elsewhere in the body, has undoubtedly much to do with the development of these neoplasms, as has furthermore pathological irritation. Gonorrhœa of long standing, hypertrophy of the prostate causing stagnation of part of the bladder-contents, lithiasis of long duration, etc., are all causative influences of this state of irritation. Concerning the statistics of tumors of the urinary blad-

we find that, from May, 1871, to January, 1885, of 8,139 cases treated in the surgical department of the Augusta Hospital in Berlin, 305 had diseases of the urinary passages = 3.74%. Among the latter were 10 cases with tumors of the bladder, *i. e.*, 0.12% of the number admitted, or 3.2% of those afflicted with diseases of the urinary passages.

Of further interest is the fact, that during the same period 1,308 patients with tumors were admitted, the 10 with tumors of the bladder making, therefore, 0.76% of this whole number. Gurlt published, in 1880, statistics of 16,637 cases of tumors, collected from the reports of three large Vienna Hospitals. In 66 cases of this number, the bladder was the seat of disease, = 0.39%. Regarding the sex of those affected with this trouble, we find that in Gurlt's 66 cases, 46 were males, 20 females; in Sperling's 114 cases, 78 were males, 36 females; in Thompson's 20 cases, 18 were males, 2 females. Willy Meyer gives 2 cases, both males; Pousson 35 cases, of which 15 were males, 20 females; and finally 11 of Kuster's 12 cases were males. This would make a total of 249 cases, 170 of which were males, and 79 females.

Tumors of the urinary bladder develop in very many cases without marked symptoms. Their existence will be suspected, when bloody urine is suddenly passed by an individual, until then to all appearances perfectly healthy. These haemorrhages, however, must be distinguished from those caused by other lesions in the urinary tract.

In haemorrhages from the kidneys the urine is generally evenly mixed with blood, but this may also be the case when slight haemorrhages of the bladder have taken place and the blood retained long enough to have become diffused in the urine. It is otherwise in cases of tumors of the bladder, at least in the earlier stages of their development. In micturition the stream of urine is at first quite clear, becoming gradually bloody and consisting finally of apparently quite pure blood.

A second very important symptom is the passing of particles of the neoplasm with the urine. This takes place at times to quite an astonishing degree, surprisingly large quantities being passed within a short time. From a microscopical examination of these particles a diagnosis of the existence and character of a tumor may be made. Other

symptoms consist in disturbances in urinating, and pain, in some cases, intense; in others, however, very slight. The patients complain frequently of a heavy, bearing-down sensation in the perineal region, and of a frequent desire to stool. Catarrh of the bladder is never absent in the long course of the disease, adding much to the general discomfort of the patient by the accompanying chills and high fever.

The general form and consistency of a tumor of the bladder may be usually determined by palpation above the symphysis and through the rectum, in women through the vagina. The introduction of instruments should be undertaken with care, as catarrh often results from this procedure. Thorough disinfection of the catheters, etc., used with a 5% solution of carbolic acid is advisable; also a careful cleansing of the glans penis and orifice of the urethra in both men and women, before introducing any instruments. The author employs a catheter of his own construction, having a long opening near its extremity on the under side. He uses this like a scoop, pulling off portions of the neoplasm for microscopical examination.

Hæmorrhage should not be feared, from its use, as it is slight if it occurs at all. A further means of diagnostic value is endoscopy of the bladder or cystoscopy, of which there are two methods. By the one, the older method, the light is directed from without, through suitable tubes into the bladder (Désormeaux, Grilnfeld). In the other method, the source of light (a platinum wire kept glowing by means of an electric current) is carried directly into the bladder. Of all methods of examination, however, the most important is the digital exploration, for the knowledge of which we are indebted to Simon's method of dilatation of the female urethra mentioned above. The introduction of the finger into the bladder in females, after dilatation of the urethra has been accomplished, presents no great difficulty, but in males the case is different. We are obliged here to open the urethra in the membranous portion and dilate the prostatic portion so as to pass the finger into the bladder. Some operators, as Volkmann, use the finger as a dilator instead of the instruments constructed for that purpose. The author used Simon's specula, modified somewhat. Although palpa-

centrically hypertrophied bladder-wall led him to believe in the presence of a carcinoma, the autopsy, however, showing the case to have been one of purulent cystitis. The irregular fossæ between the trabecula gave the feeling of a deep irregular destruction of the tissues.

If we take a retrospective view of all the diagnostic means at our disposal, we shall see that no single one of these is in itself sufficient to enlighten us completely as to the nature of the trouble, in all cases, but that a combination of several will be necessary for this purpose.

Since benignant neoplasms in the bladder, with hardly an exception, threaten the existence of the patient, their removal is therefore desirable. Tumors attached by means of thin pedicles are removed in various ways. Volkmann twisted the tumor in one case; Kocher uses a scoop, passing it into the bladder along with the finger. Thompson advises, in cases where the pedicle is thick and large, to tear it away or bite it off with the forceps. For this purpose he has constructed a forceps with denticulated edges, similar to those used for the extraction of stones from the bladder. The use of the instrument requires the greatest care, the danger of injury to other parts being considerable. At times it will be possible to draw down the tumor (especially in female patients), far enough to get a clear view of the point of its attachment to the bladder, when it can be easily removed by the knife, and the bladder walls closed with sutures, thus effectually preventing haemorrhage. When the tumor is favorably situated, this procedure may be successfully carried out in males by dilating the urethra in the prostatic portion after the incision in the median line.

If this manner of removal is not possible, either on account of the large size or position of the tumor, the bladder must be opened above the symphysis, in females also through the vagina.

Colpcystotomy was first recommended and improved by Simon, but his method seems never to have found many followers. The author gives but three cases where tumors were removed in this manner, one of Kaltenbach, a second of Lindemann, the third of Schlegtendal.

Epicystotomy is without doubt the best of all methods of removal in both sexes, and gives the most complete survey of the interior of the bladder. Until recently the development of this operation has been rather retarded, owing principally to the fear of injuring the per-

itoneum during the operation, and to producing infiltration of urine in the perivesical tissues.

To avoid the former of these dangers, the bladder should be filled with some antiseptic fluid before the operation, or the incision should be made slowly and carefully, the tissues being divided layer by layer. Petersen fills the bladder with 400 to 600 grammes of some antiseptic fluid, and introduces a colpeurynter containing some 400 grammes of warmed fluid into the rectum. By this latter means the bladder is forced up over the edge of the symphysis, rendering injury to the peritoneum almost impossible. Infiltration of the urine into the surrounding tissues will take place only when the urine is allowed to collect in large quantities in the bladder and flow out through the wound. This is best prevented by drainage, a good manner of accomplishing which is to pass a rubber tube, having lateral apertures through the wound and out through the urethra; at the same time plugging up the abdominal wound with pieces of iodoform mull. Guyon uses the thermo-cautery for removing the neoplasms of the bladder, cauterizing the wound-surface afterwards. The author, however, does not recommend this method, especially in cases of larger growths, as the wound thus left will be long in healing and a constant cause of catarrh. He prefers an elliptical cut around the tumor, uniting the edges afterwards with catgut sutures.

For the extirpation of deep seated tumors, in the fundus or trigonum, Trendelenburg's method for directing the light onto the field of operation, may be employed with advantage. This consists in suspending the patient, head downwards, by his legs over the back of an attendant and turned towards the light, so that the latter shines directly into the bladder when the wound-edges are separated. The bladder and intestines sink downwards and parts hidden behind the symphysis come into view.

Of vast importance for the operation and after-treatment would be the possibility of keeping the bladder free from urine during this whole period. This would only be possible by introducing catheters into the ureters and allowing them to remain there for a considerable space of time. That such a procedure may be carried out without grave results, we have seen in a case of Schede, where the catheter remained

in the ureter for seven days. By properly illuminating the interior of the bladder, the openings of the ureters are easily seen and the introduction of instruments not difficult. The author uses for this purpose thin, elastic bougies, as he considers the use of Simon's metal catheters too dangerous.

The treatment of malignant tumors of the urinary bladder has consisted for the main part, until the present, in scraping away portions of them and cauterizing the surface in order to retard, if possible, their rapid growth.

Radical treatment has been only undertaken in cases where the carcinoma was favorably situated, for example, on the anterior wall of the bladder. Successful operations for carcinoma in other parts of the bladder should not be considered impossible, if the limits of the mucous membrane have not been passed, for which, of course, an early diagnosis of the disease will be necessary.

In conclusion, Küster thinks that the therapy of tumors of the bladder, far from being so hopeless as formerly thought, has improved so much that the larger number of those suffering from this terrible malady may be almost definitely cured by a timely and proper operation.

C. J. COLLES.

ON THE PRESENT STATE OF KNOWLEDGE IN BACTERIAL
SCIENCE IN ITS SURGICAL RELATIONS.

(Concluded from page 150).

ACTINOMYCOSIS—ANTHRAX—GLANDERS.

The study of those branches of bacteriology which have direct bearing upon veterinary surgery and public economy has borne more practical fruit than any other department of the science, leading, as it has done, to an early and comparatively complete knowledge of certain zoonotics, as instanced, at least in Europe, by the successful enforcement of public and private measures by legislative bodies and cattle-farmers for the purpose of preventing the occurrence and spread of such diseases. And out of these investigations, of such practical value